

AUTOMATIC BOOKKEEPING SYSTEM

FIELD OF THE INVENTION

The present invention relates to an automatic bookkeeping system, especially to a bookkeeping system that automatically generates charts and statements including
5 bookkeeping data.

BACKGROUND OF THE INVENTION

As the computer system has been widely used in the daily operation, bookkeeping systems including bookkeeping software that is executable in a computer system have been developed and made available to business and individual
10 users. These bookkeeping systems allow user to input bookkeeping data, record the data into the respective categories they belong to and generate all kinds of bookkeeping, accounting or financial charts and statements, such as income statement, balance sheet, upon the request of the users.

The conventional bookkeeping system is designed based on the theories, rules
15 and practices generally accepted in the field of “accounting”. In other words, when a unit of bookkeeping data is input, it is connected to the representing “code” (accounting code) of the “item” that the unit of data belongs, which code will then be used a basis of classification and calculation in the processing of the bookkeeping data. In such a system, the input, classification and utilization of the bookkeeping data shall
20 strictly follow all the theories and regulations as accepted in the learning of accounting. Data as input and processed can hardly be used for purposes other than generating bookkeeping, accounting or financial charts and statements.

To be more specific, the conventional bookkeeping system is designed to

facilitate users to generate and edit financial statements. Format and content of all these charts and statements shall follow the unchangeable principles and regulations already established in the field of accounting or auditing. The conventional bookkeeping system is designed to allow users to easily input, edit and delete data to
5 be filled into the readily specified columns or format of the desired charts and statements. Bookkeeping, accounting and financial charts and statements containing such data are generated to be read and studied by professionals who were trained to read these charts and statements. As a result, the purpose of the conventional bookkeeping system is to allow professional users to input, revise and delete data into
10 or from charts and statements in specific formats; Information so generated is not for the use of ordinary people.

In addition, as the conventional bookkeeping system is designed to generate charts and statements, data to be included into different charts and statements are of different formats. Although the data represent the same “content” or “meaning” in the
15 mind of the human being, they are not to be shared among systems that generate different charts and statements, since they might require data in different formats. One system is not allowed to utilize data designated to another system before an additional converting program is provided. Some accounting systems use the technology of the database system to allow bookkeeping data to be shared by different charts and
20 statements. However, as described above, the purpose of the conventional system is to generate and edit desired charts and statements. Data that can be shared by the subsystems of an accounting or bookkeeping system can hardly utilized by other systems, such as the personnel system, the financial system, the marketing system, the production system etc. Although some large scaled software systems provide
25 solutions for the conversion of data from system to system, these systems are large in

scale, expensive and complicated. Development of such systems requires high costs and long time, which are not affordable to ordinary business units.

Nevertheless, the conventional bookkeeping system is designed for professionals. The bookkeeping and accounting operations in the conventional system, such as
 5 classification, connection, formulation, adjustment, correction and interpretation of information contained in the system, except calculation, are conducted by these professionals. Such a system is not an automatic bookkeeping system. Even the computer system is used, users of the conventional system play an important role in the rationalization of the accounts.

10 It is thus necessary to provide a novel bookkeeping system to allow input bookkeeping data to be shared by different chart and statement systems, without the need of complicated conversions.

It is also necessary to provide an automatic bookkeeping to allow ordinary users to conduct all kinds of bookkeeping operations and to automatically generate desired
 15 bookkeeping, accounting and financial charts and statements.

It is also necessary to provide a bookkeeping system that generates bookkeeping data useful in other systems.

It is also necessary to provide an automatic bookkeeping system to automatically allocate in a bookkeeping database desired information to rationalize bookkeeping,
 20 accounting or financial accounts.

OBJECTIVES OF THE INVENTION

The objective of the invention is to provide a novel bookkeeping system to allow input bookkeeping data to be shared by different chart and statement systems, without

the need of complicated conversions.

Another objective of the invention is to provide an automatic bookkeeping to allow ordinary users to conduct all kinds of bookkeeping operations and to automatically generate desired bookkeeping, accounting and financial charts and statements.

Another objective of the invention is to provide a bookkeeping system that generates bookkeeping data useful in other systems.

Another objective of the invention is to provide an automatic bookkeeping system to automatically allocate in a bookkeeping database desired information to rationalize bookkeeping, accounting or financial accounts.

SUMMARY OF THE INVENTION

According to this invention, an automatic bookkeeping system is provided. The invented automatic bookkeeping system comprises: a user interface, comprising a plurality of bookkeeping data editing interface allowing user to input, revise and delete useful bookkeeping data; a bookkeeping database, comprising a plurality of bookkeeping data files to record bookkeeping data; a chart and statement generating module provided with formats and definitions of a plurality of bookkeeping related chart and statement to automatically obtain needed data from said bookkeeping database and to generate bookkeeping related charts and statements using the obtained data according to format and definitions of particular chart or statement; a data file connection module to automatically connect a unit of input data to related bookkeeping data files according to features of said unit of input data to generate one or more unit of bookkeeping data; and an inference module, provided with a plurality of financial inference rules, to obtain data from said bookkeeping database and to

operate according to particular inference rules using the obtained data. Charts and statements generated by the automatic bookkeeping system include: journal, ledger, income statement, balance sheet and other financial statements.

The above and other objectives and advantages of this invention may be clearly understood from the detailed description by referring to the following drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates the system diagram of the automatic bookkeeping system of the invention.

Fig. 2a shoes the editing page for data regarding “Description” of purchased operational assets, used in one embodiment of this invention.

Fig. 2b shows the editing page for data regarding “Closing” of purchased operational assets, used in the embodiment of Fig. 2a.

Fig. 2c shows the editing page for data regarding “Payment” of purchased operational assets, used in the embodiment of Fig. 2a.

Fig. 3 shows a sample “Operational Assets” chart applicable in the automatic bookkeeping system of this invention.

Fig. 4 shows the first page of a sample “Details of Asset” chart applicable in the automatic bookkeeping system of this invention.

Table I shows the classification system of bookkeeping data of the automatic bookkeeping system of this invention.

Table II shows a part of the financial statement connection table, in category “Assets”, used in one embodiment of the present invention.

Table III shows part of the “Income Book Connection Table”, used as one book connection table in this invention.

Table IV shows several formulas for the calculation of analytic elements in financial analysis, pertaining to “Capital Structure”, applicable in the automatic
5 bookkeeping system of this invention.

DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 illustrates the system diagram of the automatic bookkeeping system of the invention.. As shown in this figure, the automatic bookkeeping system comprises: a user interface 10, comprising a plurality of bookkeeping data editing interface 11
10 allowing user to input, revise and delete useful bookkeeping data; a bookkeeping database 20, comprising a plurality of bookkeeping data files to record bookkeeping data; a chart and statement generating module 30 provided with formats and definitions of a plurality of bookkeeping related chart and statement to automatically obtain needed data from said bookkeeping database 20 and to generate bookkeeping
15 related charts and statements using the obtained data according to format and definitions of particular chart or statement; a data file connection module 40 to automatically connect a unit of input data to related bookkeeping data files according to features of said unit of input data to generate one or more unit of bookkeeping data; and an inference module 50, provided with a plurality of financial inference rules, to
20 obtain data from said bookkeeping database 20 and to operate according to particular inference rules using the obtained data. Charts and statements generated by the automatic bookkeeping system include: journal, ledger, income statement, balance sheet and other financial statements.

The automatic bookkeeping system of this invention is designed under the basis

of a bookkeeping data classification system which is similar to the classification system of the balance sheet as used in many accounting applications. Table I shows the bookkeeping data classification system of the automatic bookkeeping system of this invention. As shown in this Table, bookkeeping data that have similar features in the bookkeeping processing are defined as one item (class). As a result, bookkeeping data that belong to the same item or class require similar processing in the automatic bookkeeping system of this invention. Bookkeeping data belonging to different item or class may require different processing in the automatic bookkeeping system of this invention. Of course, other classification system that classifies bookkeeping data according to features in the bookkeeping processing may also be applied in this invention.

Based on the above-described classification system, the user interface 10 of this invention includes a plurality of data editing interfaces or data editing pages 11, each basically corresponding to one class or item of the classification system. In the bookkeeping database 20, basically one data file format is given to define or describe data belonging to the same class or item. A unit of bookkeeping data is stored in the data file 21 that includes format information for the unit of data, in correspondence with the related data format.

Editing interface or editing pages for the bookkeeping data are designed to allow users to input, revise and delete bookkeeping data in the related data file. To illustrate the editing interface or editing pages of the user interface 10, the editing pages for transaction records of operational assets will be shown as an example. Fig. 2a shows the editing page for data regarding "Description" of purchased operational assets, used in one embodiment of this invention. As shown, the editing page for the transaction record of operational assets is divided into two categories, "Purchase" and

“Sell”. The “Purchase category is divided into three editing pages. They are “Description”, “Closing” and “Payment”. The “Description” page is the default page. Users may input, revise or delete desired data in the editing page. The purpose of this editing page is to allow the user to establish description of operational assets as purchased.

Fig. 2b shows the next editing page following page “Description”, page for data regarding “Closing” of purchased operational assets. This editing page allows users to edit data relating to transactional conditions of the purchased operational assets. Fig. 2c shows the editing page for data regarding “Payment” for purchased operational assets. This page allows users to edit data regarding details of payment for the purchased operational assets. All kind of necessary or useful information to describe details of a transaction and the asset may be input, revised and deleted from the editing page. Of course, these figures are only for illustration purposes. Any editing page that allows users to edit useful information regarding the transaction of an asset may be used in this invention.

The page arrangement, pagination, column arrangement, format and content of editing pages of other items, categories or classes, may be easily understood by those skilled in the art by referring to the above illustration. Detailed description thereof is thus omitted.

The automatic bookkeeping system of this invention provides a data file connecting module 40 to connect input bookkeeping data to one or more units of data belonging to other data files. For example, when data regarding a purchased asset are established, the data are stored in a data file belonging to the category of “Assets”. At the same time, the data file connecting module 40 automatically creates a unit of data to include the input data in the data file belonging to the category of “account

payable”, “notes payable” or “cash” and another unit of data to include the input data in the data file belonging to the category of “value-added tax” or “consumer tax” or “sales tax”. As a result, in item “account payable”, “notes payable” or “cash”, a transaction is recorded and the account may be adjusted accordingly. At the same time, in item “value-added tax”, a new record will be added to adjust the amount of tax payable.

The bookkeeping database so established includes data files corresponding to all the categories or items as shown in Fig. 2, respectively. Every data file includes numerous units of bookkeeping data. Data belonging to a data file are recorded according to specific formats.

Taking the “operational asset” for example, every transaction record file of operational asset will include a purchase record and a sell record.

In the purchase record, information as recorded includes: description of asset, details of transaction, description of seller, conditions of transaction, history and method of payment etc.

In the sell record, information as recorded includes: description of asset, details of transaction, description of buyer, conditions of transaction, history and method of payment collection etc.

Data files belonging to other categories or items include desired data in desired format. Content and format of such data are designed according to features of processing data in the respective categories or items.

In the automatic bookkeeping system of this invention, a chart and statement generating module 30 is provided to generate all kinds of desired charts and statements, including: daily journal, ledger, income statement, balance sheet and other

financial statements. In the chart and statement generating module 30 provided are sample charts and statements which format, columns, content of data and calculation and inference regulations are already defined. When an instruction from the user is received by the automatic bookkeeping system, sample of the desired statement is
 5 picked up and the columns in the statement are filled with data obtained from the bookkeeping database 20 or with results of calculation or inference using data in the database 20. A desired chart or statement is so generated.

Fig. 3 shows a sample “Operational Assets” chart applicable in the automatic bookkeeping system of this invention. As shown in this figure, the sample
 10 “Operational Assets” chart belongs to category “Fixed Assets” chart in the “Ledger” file. Three sample charts are provided under the category “Fixed Assets”. They are: land, building and factory, and operational assets. In the “Operational Assets” chart of Fig. 4, detailed information specifying an asset which may be obtained from the bookkeeping database may be shown and includes columns of: category of asset, title
 15 of asset, brand name, date of account, quantity, unit price, value etc. At top of the chart shown are total number and value of assets which figures are calculated using data to be filled into the above-said columns. A button is provided inside the chart, labeled as “Details”. When the user clicks on this button, details of the desired asset are called out from the bookkeeping database and shown in the user interface 10. Fig.
 20 4 shows the first page of a sample “Details of Asset” chart that may be displayed when a “Details” button is clicked. Details of the desired asset are shown in the respective columns of the chart. In the following page(s), information such as variation of value and other historic information of the same asset may be shown.

Figs. 4 and 5 illustrate how a ledger may be generated by the automatic
 25 bookkeeping system of this invention. Other charts and statements may be generated

in a same or similar way. For example, when a balance sheet is to be generated, the chart and statement generating module 30 obtains data that are labeled as “current information” from related data files in the bookkeeping database 20. The data are used as basis of calculation and inference so that desired data and figures are obtained and displayed in their corresponding columns. Since the automatic bookkeeping system of this invention provides correct classification of bookkeeping data and defines correct connection relations between or among data files, desired charts and statements are easily generated and contents of the charts and statements are correct, without the need of manual adjustments.

In addition, bookkeeping data stored in the bookkeeping database of this invention have explicit and precise definitions in their format, column and content. Such data may be utilized by a plurality of systems, without the need of reinstallation or additional converting programs. This goal is accomplished by, among others, using a classification system that exhaustively defines all bookkeeping activities of an enterprise or a business unit. To maintain such an effect, to forbid users from altering the classification system is highly recommended.

In the connection of the bookkeeping data, the data file connection module 40 of this invention uses a plurality of look-up-tables to define necessary and correct connections between or among data files. The look-up-tables include at least one financial statement connection table 41 and a book connection table 42. The financial statement connection table 41 defines inference relations between columns of data in respective data files that correspond with related categories or items and columns of respective financial statements such as the balance sheet, income statement etc. The book connection table 42 on the other hand defines the connections between columns of data in respective data files that correspond with related categories or items and

columns of respective accounting books. As the connections are so defined, correct charts and statements and books may be easily generated after calculation or inference using data in the connected columns.

Table II shows a part of the financial statement connection table, in category
5 “Assets”, used in one embodiment of the present invention. Some inference relations between the related columns of an asset data file and the corresponding columns in the balance sheet and the income statement are shown. Table III shows part of the “Income Book Connection Table”, used as one book connection table in this invention. Some connections between columns of data files in the bookkeeping database 20 and
10 particular income items and expense items or cost items in a profit and loss account. Those skilled in the art may easily understand the connection or inference relations between other columns of data in the bookkeeping database and columns in other books, charts or statements by referring to the above illustration.

The automatic bookkeeping system of this invention further provides an
15 inference module 50. The inference module 50 includes a plurality of inference formulas and conducts inference using data in the bookkeeping database 20 according to desired inference formulas. The inference module 50 is particularly useful in the generation of analytic elements in financial analysis. Table IV shows several formulas for the calculation of analytic elements in financial analysis, pertaining to “capital
20 structure”, applicable in the automatic bookkeeping system of this invention. Other formulas regarding analytic elements pertaining to other factor in financial analysis may also be provided in the inference module 50. As a result, when the user clicks on the user interface 10, required information may be easily generated.

As the present invention has been shown and described with reference to
25 preferred embodiments thereof, those skilled in the art will recognize that the above

and other changes may be made therein without departing from the spirit and scope of the invention.